



PATENT SPECIFICATION

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645,721

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PROVISIONAL SPECIFICATION

No. 5263 A.D. 1948.

Improvements relating to Amusement Cars

We, DUO RUBBER AND ENGINEERING COMPANY LIMITED, a British Company, of Aldersley Road, Tettenhall, Wolverhampton, Staffordshire, do hereby declare the nature of this invention to be as follows:—

This invention relates to amusement cars such as dodge'm cars which are driven by an electric motor. Such cars are provided with bumper means comprising a surrounding tyre formed of resilient means such as rubber or a rubber compound in order to protect cars which collide. It is found in practice that when a pair of cars collide there is a binding action between the rubber bumpers which holds the cars stationary for a period resulting frequently in the burning out of the motors.

It is an object of the present invention to provide improved bumper means for amusement cars whereby such binding is prevented.

According to the present invention the resilient bumper of an amusement car is provided with a metal surfacing on the operative face of the bumper.

The metal surfacing preferably comprises a series of plates of steel or other suitable metal which are bonded to the rubber or rubber compound tyre.

The plates may be of shallow channel form so that the flanges partially extend over the upper and lower surfaces of the tyre.

In carrying the invention into effect the bumper comprises a continuous solid tyre formed of rubber or rubber compound which is capable of slight elongation for applying it to the grooved seating provided on the car body.

On its outer surface which lies vertical when in position, the tyre is provided with a continuous series of metal plates which

are slightly spaced from one another so that said surface is substantially covered by the plates.

The plates are bonded to the rubber tyre by any known process. The plates are preferably of shallow channel shape so that narrow flanges extend partially over the upper and lower surfaces of the tyre.

The plates may be of any suitable length, for example about 8" and may be about $\frac{1}{8}$ " thick and the flange may be about $\frac{1}{2}$ " in depth but any other suitable dimensions may be used.

The plates need not all be of the same length and shorter plates may be provided at the parts of the tyre corresponding to the front and rear of the car.

By providing a series of independent plates it will be found that the tyre will slightly elongate when being mounted on the car.

According to a further modification instead of a series of independent plates, the plates may be connected together by pins or bolts to form the links of a chain. The joints between the links may be of lapped or mortice or any other suitable construction. With such an arrangement the looseness at the joints would be sufficient to allow elongation of the rubber tyre to apply the buffer to the grooved seating on the car body.

With the improved metal surfaced bumper tyre according to the invention it will be found that when a pair of cars collide the metal plates will permit them to slide past one another whereby burning out of the motors will be avoided.

Dated this 23rd day of February, 1948.

For the Applicants,
J. RICHARD LANE,
Chartered Patent Agent,
London and Wolverhampton.

PROVISIONAL SPECIFICATION

No. 20710 A.D. 1948.

Improvements relating to Amusement Cars

We, DUO RUBBER AND ENGINEERING COMPANY LIMITED, a British Company, of Aldersley Road, Tettenhall, Wolverhampton, Staffordshire, do hereby declare the nature of this invention to be as follows:—

This invention relates to amusement cars, for example, dodg'em cars and has particular reference to bumper means for such cars.

In my application No. 5263/48 I describe improved bumper means formed of rubber or rubber compound in which the bumper surface is formed of metal plates bonded on to said surface.

The present invention relates to such bumpers and comprises improvements therein.

According to the present invention bumper means for dodg'em cars comprises a series of units linked together, each unit comprising a moulded section of rubber or rubber compound having a metal plate or plates bonded to its bumper surface and having means for coupling it to adjacent units.

The sections may have openings or recesses moulded therein to provide resilience.

In carrying the invention into effect according to one convenient mode by way of example the bumper means is formed to completely surround the vehicle and comprises an endless ring of units or links linked together end to end.

Each unit or link is formed in moulded rubber or rubber compound and is of arcuate shape to conform to the shape of the seating surface of the car body.

At its ends the rubber is moulded to form link coupling elements which are perforated to receive a coupling pin. At one end of the unit a centrally disposed coupling element is provided while at the

other end spaced coupling elements are provided between which the central element of an adjacent unit is positioned.

The coupling pins comprise stout wire which is encased in rubber bonded thereto.

The moulded rubber element or link is provided with lateral apertures or recesses to provide radial resilience.

On its outer curved face the element is provided with metal plates which are bonded to the rubber.

The plates of square or rectangular shape may be provided with flanges at each edge.

The unit may be of a length to require a pair of square plates or a shorter unit having one square plate may be provided.

The metal plates on a bumper made up of units according to the invention will allow sliding between a pair of cars and thus avoid locking of two cars and consequent burning out of the driving electric motors.

Should any plate become damaged in use the associated link may be removed and a new link inserted.

In cross vertical shape the link may be of square, rectangular, circular or other suitable shape.

Instead of the coupling means being of rubber moulded integrally with the link, metal coupling means may be provided extending through the link and projecting from its ends.

While it is preferred to form a bumper of a series of relatively short links, longer links may be employed.

Dated this 5th day of August, 1948.

For the Applicants,

J. RICHARD JANE,

Chartered Patent Agent,

London and Wolverhampton.

COMPLETE SPECIFICATION

Improvements relating to Amusement Cars

We, DUO RUBBER AND ENGINEERING COMPANY LIMITED, a British Company, of Aldersley Road, Tettenhall, Wolverhampton, Staffordshire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to amusement cars such as dodge'm cars, scooter boats, speedway cars and speed boats, herein-

after referred to as amusement cars. Such cars are provided with bumper means comprising a surrounding tyre formed of resilient material such as rubber or a rubber compound in order to protect cars which collide.

It has previously been proposed to provide such rubber or rubber compound bumper means with protective metal surfacing in the form of a continuous strip or band of metal or a continuous

channel section reinforcement mechanically secured to the rubber or rubber compound.

One object of the present invention is to provide improved bumper means capable of slight elongation for facilitating attachment to the amusement cars.

According to the present invention the resilient bumper for an amusement car is provided with a metal surfacing in the form of a series of metal plates on the operative face of the bumper.

The metal surfacing preferably comprises a series of plates of steel, bronze, gun metal or other suitable metal which are bonded to the rubber or rubber compound tyre.

The plates may be of shallow form so that the flanges partially extend over the upper and lower surfaces of the tyre.

A further object of the invention is to provide improved bumper means in which sections only need be replaced in the event of damage or wear.

According to a modification therefore, the bumper means may comprise a series of units linked together, each unit comprising a moulded section of rubber compound having a metal plate or plates bonded to its operative face. The means for linking the units together may comprise interengaging integral projections moulded in the rubber at the ends of the unit and having aligned perforations for receiving coupling pins.

In the accompanying drawings:—

Figure 1 is a perspective view of a portion of a bumper tyre according to the invention.

Figure 2 is a plan view of a unit for a bumper according to the preferred form of the invention, and

Figures 3 and 4 are perspective views of a pair of units showing the coupling means at the ends of the units.

In carrying the invention into effect according to one form the bumper comprises a continuous solid tyre 1 formed of rubber or rubber compound which is capable of slight elongation for applying it to the grooved seating provided on the car body.

On its outer surface 2 which lies vertical when in position, the tyre is provided with a continuous series of metal plates 3 which are slightly spaced from one another so that said surface is substantially covered by the plates.

The plates 3 are bonded to the rubber tyre by any known process. The plates are preferably of shallow channel shape so that narrow flanges 4 extend partially over the upper and lower surfaces of the tyre.

The plates 3 may be of any suitable

length, for example about 8" and may be about $\frac{1}{8}$ " thick and the flange may be about $\frac{1}{2}$ " in depth but any other suitable dimensions may be used.

The plates 3 need not all be of the same length and shorter plates may be provided at the parts of the bumper corresponding to the front and rear of the car.

By providing a series of independent plates it will be found that the tyre will slightly elongate when being mounted on the car.

According to a modification, instead of a series of independent plates, the plates 3 may be connected together at their ends by pins or bolts to form the links of a chain, the pins passing through aligned apertures in interengaging projections on the plates. The joints between the links may be of lapped or mortice or any other suitable construction. With such an arrangement the looseness at the joints would be sufficient to allow elongation of the rubber tyre to apply the buffer to the grooved seating on the car body.

According to the modified form of the invention shown in Figures 2, 3 and 4 the bumper means comprises an endless ring of units or links 5 coupled together end to end.

Each unit or link 5 is formed in moulded rubber compound and is of arcuate shape to conform to the shape of the seating surface on the car body.

At its ends the rubber is moulded to form link coupling elements which are perforated to receive a coupling pin. At one end of the unit a centrally disposed coupling element 6 is provided while at the other end spaced coupling elements 7 are provided between which the central element of an adjacent unit is positioned.

The coupling pins which extend through the apertures 8 comprise stout wire which is encased in rubber bonded thereto and having a head at one end. Alternatively, split pins or pins having one end bifurcated encased in rubber bonded thereto may be used, the rubber being omitted at the bifurcated end or portions of the split arms so that such may be opened when the pin is applied.

The apertures 8 accommodating the coupling pins preferably have metal linings or bushes bonded in position or otherwise secured to prevent tearing of the lugs when the bumper is tensioned. The bushes may have anchoring projections.

The moulded rubber element or link 5 is provided with lateral apertures or recesses 9 to provide radial resilience.

On its outer curved face 5a the element 5 is provided with metal plates 10 which are bonded to the rubber.

The plates of square or rectangular shape may be provided with flanges 10a at each edge. The plates may be provided with a hole or holes 10b to allow for the escape of excess rubber in the bonding process.

In addition to or instead of the flanges the plates may be provided on the inner surface with upstanding projections to increase the surface area bonded to the rubber.

The unit 5 may be of a length to require a pair of square plates 10 or a single oblong plate. Shorter units having one square plate may be provided for location at the front and rear of the vehicle, or a plurality of such short units may be used to provide the necessary length of the bumper according to the dimensions of the car.

Should any plate become damaged in use the associated link 5 may be removed and a new link inserted.

In cross sectional shape the link 5 may be of square, rectangular, circular or other suitable shape.

Instead of the coupling means 6 and 7 being of rubber moulded integrally with the link, metal coupling means may be provided extending through the unit and projecting from its ends.

While it is preferred to form a bumper of a series of relatively short links such as 5, longer links may be employed.

In applying the invention to dodge'm cars and scooter boats, the bumper means will encircle the body of the vehicle. Similarly bumper means completely encircle speedway cars and boats.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Bumper means for amusement cars comprising an encircling band or tyre of rubber or rubber compound or similar resilient material the operative face of which is provided with metal surfacing means in the form of a series of metal plates.

2. Bumper means for amusement cars as claimed in Claim 1, wherein the metal surfacing means comprises a series of plates of steel, bronze, gun metal or other suitable metal bonded to the surface of the band or tyre.

3. Bumper means for amusement cars as claimed in Claim 2, wherein the plates are provided with flanges partially

extending over the upper and lower surfaces of the band or tyre.

4. Bumper means for amusement cars as claimed in Claim 2 or 3, wherein the plates at the front and rear of the car are shorter than those at the sides.

5. Bumper means for amusement cars as claimed in Claim 2, 3 or 4, wherein the adjacent ends of the plates are coupled together to form a chain of plates.

6. Bumper means for amusement cars comprising a series of units linked or hinged together, each link comprising a moulded section of rubber or rubber compound or similar resilient material having metal surfacing means on its operative face, and having means for coupling it to adjacent units.

7. Bumper means for amusement cars as claimed in Claim 6, wherein the metal surfacing means comprises a plate or plates of steel, bronze, gun metal or other suitable metal bonded to the operative surface of the unit.

8. Bumper means for amusement cars as claimed in Claim 7, wherein the plates are provided with flanges and projecting surfaces to increase the area of the bonded surface.

9. Bumper means for amusement cars as claimed in Claim 6, 7 or 8, wherein the coupling means comprises moulded projections at the ends of the units adapted to co-operate or interengage with moulded projections on an adjacent unit, said projections being perforated to receive a coupling or hinge pin and preferably having metal linings or bushes.

10. Bumper means for amusement cars as claimed in Claim 6, 7 or 8, wherein the coupling means comprises metal coupling elements extending through the unit and projecting from its ends, the projecting parts having apertures for receiving coupling pins.

11. Bumper means for amusement cars as claimed in Claim 11, wherein the units at the front and rear of the cars are shorter, for example half the length of those at the side of the car.

12. Bumper means for amusement cars or a unit therefor, substantially as described with reference to the accompanying drawings.

Dated this 23rd day of November, 1948.

For the Applicants,

J. RICHARD LANE,

Chartered Patent Agent,

London and Wolverhampton.

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645,721 COMPLETE SPECIFICATION

1 SHEET

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[This Drawing is a reproduction of the Original on a reduced scale.]



